

[1. In a telescoping mast assembly, including:

a plurality of nesting, telescoping mast sections, including a top section and at least one lower section, each of said sections having upper and lower ends, and

5 means for extending and retracting each of said sections relative to the next-lower section

the improvement comprising:

a payload, located only in said top section,

10 said top section, including said payload, being dimensioned to be received and nest within the next-lower section,

at least a portion of said payload being received within said next-lower section when said top section is fully retracted,

such that said next-lower section provides protection for

15 said payload when said top section is fully retracted,

said payload being a member of the group consisting of radio antennas, lights, instrumentation and telemetry packages for robotic vehicles, television cameras, antenna rotators, preamplifiers, radiation sensors and electronic and electro-mechanical instrument packages.

- 5 2. The assembly of claim 1 mounted on a vehicle.
3. The assembly of claim 1, in which said payload is an antenna for electromagnetic energy.
4. The assembly of claim 1, in which said lower section is radiopaque.
5. The assembly of claim 1 which further includes:
- 10 (a) a transmission line cable for transmitting a signal to or from said payload; and
- (b) a sub-assembly for stowing and dispensing said cable when said mast assembly is retracted and extended.]

6. A telescoping mast-payload assembly for reducing the retracted height of a mast-payload assembly and for providing protection of a payload when said mast-payload assembly is retracted, said mast-payload assembly comprising:

(a) a telescoping mast component extending and retracting along the mast's longitudinal axis defining a mast axis, said telescoping mast component comprising:

a telescoping mast, adapted to telescope upwardly along said mast axis to an extended position and to telescope downwardly along said mast axis to a retracted position, said telescoping mast comprising:

a fixed bottom section being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section;

a plurality of extending and retracting non-payload carrying intermediate mast sections, each section having upper and lower ends and being shaped and dimensioned to include a hollow region for telescopically receiving the next higher mast section; and

an extending and retracting payload section shaped and dimensioned to be telescopically received within the hollow region of the uppermost section of said intermediate sections;

5 said intermediate support sections and said payload section being constructed to telescopically retract along said mast axis within the hollow region of the next lower mast section and to telescopically extend along said mast axis above the next lower mast section, said plurality of intermediate support sections supporting said payload section when said mast is extended to said extended position and receiving and protecting said
10 payload section when said mast is retracted to said retracted position; and

(b) a payload component of said assembly forming at least a portion of said payload section, and being shaped and dimensioned to extend along said mast axis to be supported above the next-lower support section when said mast-payload assembly is extended to said extended position and to
15 retract along said mast axis and to be at least partially received and protected within said non-payload carrying intermediate support sections when said mast is in retracted to said retracted position.

7. The telescoping mast-payload assembly of Claim 1 wherein the payload is a member of the group consisting of radio antennas, lights, television cameras, antenna rotators, preamplifiers, radiation sensors, instrumentation and telemetry packages for robotic vehicles, and electronic and electro-mechanical instrument packages.

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8. The telescoping mast-payload assembly of Claim 1 wherein the payload is a radio antenna.

9. The telescoping mast-payload assembly of Claim 1 being mounted on a vehicle.

10. The telescoping mast-payload assembly of Claim 3 being mounted on a vehicle.

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11. The telescoping mast-payload assembly of Claim 1, further including motor drive means for extending and retracting said payload section and said intermediate support sections relative to said bottom section.

12. A telescoping mast-payload assembly for reducing the retracted height of a mast-payload assembly and for providing protection of a payload when said mast-payload assembly is retracted, said mast-payload assembly comprising:

(a) a telescoping mast component extending and retracting along the mast's longitudinal axis defining a mast axis, said telescoping mast component comprising:

a telescoping mast, adapted to telescope upwardly along said mast axis to an extended position and to telescope downwardly along said mast axis to a retracted position, said telescoping mast comprising:

a fixed bottom section being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section;

a plurality of extending and retracting non-payload carrying intermediate mast sections, each section having upper and lower ends and being shaped and dimensioned to include a hollow region for telescopically receiving the next higher mast section; and

an extending and retracting payload section shaped and dimensioned to be telescopically received within the hollow region of the uppermost section of said intermediate sections;

5 said intermediate support sections and said payload section being constructed to telescopically retract along said mast axis within the hollow region of the next lower mast section and to telescopically extend along said mast axis above the next lower mast section, said plurality of intermediate support sections supporting said payload section when said mast is extended to said extended position and receiving and protecting said
10 payload section when said mast is retracted to said retracted position;

(b) a payload component of said assembly forming at least a portion of said payload section, and being shaped and dimensioned to extend along said mast axis to be supported above the next-lower support section, when said mast-payload assembly is extended to said extended position and to
15 retract along said mast axis and to be at least partially received and protected within said non-payload carrying intermediate support sections when said mast is in retracted to said retracted position; and

(c) motor drive means for extending and retracting said payload section and said intermediate support sections relative to said bottom section.

13. The telescoping mast-payload assembly of Claim 7 wherein the payload is a member of the group consisting of radio antennas, lights, television cameras, antenna rotators, preamplifiers, radiation sensors, instrumentation and telemetry packages for robotic vehicles, and electronic and electro-mechanical instrument packages.

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14. The telescoping mast-payload assembly of Claim 7 wherein the payload is a radio antennae.

15. The telescoping mast-payload assembly of Claim 8 being mounted on a vehicle.

16. The telescoping mast-payload assembly of Claim 9 being mounted on a vehicle.

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17. The telescoping mast-payload assembly of Claim 7 further comprising:
a transmission line cable for transmitting a signal to or from said payload; and
a subassembly for stowing and dispensing said cable when said mast assembly is
retracted and extended.

5 18. A vehicular mounted telescoping mast-payload assembly for reducing the
retracted height of a mast-payload assembly and for providing protection of a payload
when said mast-payload assembly is retracted, said mast-payload assembly comprising:

(a) a telescoping mast component extending and retracting along the mast's
longitudinal axis defining a mast axis, said telescoping mast component
10 comprising:

a telescoping mast, adapted to telescope upwardly along said mast
axis to an extended position and to telescope downwardly along
said mast axis to a retracted position, said mast comprising:

a fixed bottom section being shaped and dimensioned to
15 include a hollow region for telescopically receiving a next
higher mast section;

an extending and retracting non-payload carrying intermediate mast section, said section having an upper and lower end and being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section; and

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an extending and retracting payload section shaped and dimensioned to be telescopically received within the hollow region of said intermediate section;

said intermediate support sections and said payload section being constructed to telescopically retract along said mast axis within the hollow region of the next lower mast section and to telescopically extend along said mast axis above the next lower mast section, said intermediate support section supporting said payload section when said mast is extended to said extended position and receiving and protecting said payload section when said mast is retracted to said retracted position;

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(b) a payload component of said assembly forming at least a portion of said payload section, and being shaped and dimensioned to extend along said mast axis to be supported above the next-lower support section when said mast-payload assembly is extended to said extended position and to retract along said mast axis and to be at least partially received and

protected within said non-payload carrying intermediate support section
when said mast is retracted in said retracted position; and

(c) attachment means for attaching said bottom section to a vehicle.

5 19. The telescoping mast-payload assembly of Claim 13 wherein the payload
is a member of the group consisting of radio antennas, lights, television cameras,
antenna rotators, preamplifiers, radiation sensors, instrumentation and telemetry
packages for robotic vehicles, and electronic and electro-mechanical instrument
packages.

10 20. The telescoping mast-payload assembly of Claim 13 wherein the payload
is a radio antennae.

21. The telescoping mast-payload assembly of Claim 14 further comprising:
a transmission line cable for transmitting a signal to or from said payload; and
a subassembly for stowing and dispensing said cable when said mast assembly is
retracted and extended.

22. The telescoping mast-payload assembly of Claim 13, further including motor drive means for extending and retracting said payload section and said intermediate support sections relative to said bottom section.